presence of the embedded base of older equipment, but as this is replaced with newer assets, embedded costs will also decline. In a mature network (one for which new growth is small relative to the size of the current network), the time trend of costs should be relatively similar for both cost methodologies. It is only discrete and abrupt changes in technology that produce large and discontinuous differences between embedded and forward-looking costs.

There are some additional differences between the two cost concepts. In the regulatory world, embedded costs often reflect prescribed depreciation lives – these have historically been set fairly long in order to reduce the revenue requirement, and thus prices, during the early years of an asset's life. Forward-looking cost uses economic depreciation that usually involves shorter asset lives. Embedded operating cost (this includes overhead, maintenance, labor, etc.) reflects the most recent actual cost experience of the firm, while forward-looking operating cost would reflect costs that would be incurred in the near future. Plant Loading or utilization rates (the amount of plant required to serve a level of demand) may also differ: embedded costs use utilization rates that are based on current plant in service while forward-looking cost assumes plant is placed to meet anticipated future demand. The choice of utilization rates affects the calculation of unit costs. Embedded cost necessarily reflects the accumulated effects of differences between forecasted and actual demand over time. Forward-looking cost may or may not reflect such differences, depending on the assumptions made regarding future demand levels.

We should only expect forward-looking costs to be substantially lower than embedded costs if technology is improving rapidly, or if input prices are rapidly decreasing, or if utilization of

facilities is expected to rise rapidly. None of these conditions apply to rural ILEC loop costs for universal service. Some costs (e.g., maintenance) have declined over time while others have increased (e.g., conduit installation costs). Technological progress has been gradual and modest, particularly for loop plant. Utilization rates are likely to fall as intermodal competition increases. Thus, the difference between embedded and forward-looking loop costs should not be dramatic – unless speculative efficiency gains are included in the latter estimate.

Switching costs present different issues for USF cost methodology. Switching costs have been dropping more rapidly while loop costs have not been dropping. Switching costs remain higher for smaller carriers, since scale economies still exist and switching capacity must be added in discrete increments. Increased modularity in switch capacities, and increasing use of IP-based technology, has begun to lower switching costs dramatically. To the extent that forward-looking switching costs are now significantly below embedded switching costs the choice of cost methodology would appear to present quite different levels of provisioning costs for USF purposes. In this case, however, there is no justification for using the (presumably) much lower forward-looking switching costs rather than the embedded cost.

The problem is that today's embedded switching costs reflect efficient investment decisions in the past. Unless it can be shown that deployment of the switches currently in use was inefficient at the time these were installed, failure to permit cost recovery of these switches presents only illusory cost savings. If newer switching technology is cheaper than continued use of embedded switching equipment, then the old equipment should be replaced. This

means that such equipment is economically obsolete and today's depreciation costs should reflect this fact. On the other hand, if new switching technologies are only less expensive if there was no embedded base of switches, then this potentially lower forward-looking cost is a dangerous illusion. It may represent a forward-looking cost for a new carrier with no existing network, but it does not represent the forward-looking cost for a carrier that has an existing network with which they have been providing universal service in high-cost areas.[3]

It would be poor USF policy to base support on an assumption that new technology is now available that may be cheaper than the embedded base of equipment that is being used to provide universal service today. Either the embedded equipment has not been adequately depreciated to reflect this fact (past under-funding of universal service), or a one-time reduction in USF would be obtained at the expense of future investment in high-cost areas. Depriving carriers of recovering the costs of past efficient decisions whenever new technology becomes available will change their future decisions. It would become less rational to deploy technologies that may become obsolete in the future. This scenario would have deprived rural America of many services that are available today (e.g., today's switching capabilities). The future would be one in which only investments that can be recovered quickly would be undertaken – and this is precisely the opposite to the goals of universal service.

Switching is not the primary cost of universal service. Loop costs are the largest cost component of rural ILEC costs, and these have not been subject to the same rapid

[3] This provides an additional reason why it is inefficient to provide USF to CETCs at the level of the rural ILEC's costs. CETCs may have different cost structures than rural ILECs.

technological progress as switching. Forward-looking loop costs should not differ much from embedded costs, unless a speculative cost standard is applied. If one is willing to speculate that future costs will be lower due to unspecified efficiency gains, then forward-looking cost will be correspondingly lower than embedded cost. Such an exercise requires validation, however. The results must be shown to be reasonable – for instance, with a showing of specific changes in technology or practices that would lead to measurable cost reductions. Absent such validation, forward-looking costs have no floor: they will be lower the more you are willing to speculate. Use of such speculative costs is poor regulatory practice for a number of reasons:

- The use of a speculative cost standard rewards investment in the regulatory process. This increases the resources consumed by regulation as well as inhibiting market forces from governing outcomes.
- Speculative costs are likely to be incorrect. Even if they are accurate, on average, some firms will receive windfalls and others will be short-changed on the basis of speculations that are not realized.
- Speculative costs are contrary to the provision of "sufficient and predictable" support.

Forward-looking costs have inherent estimation problems, particularly for small rural carriers.

Forward-looking cost models are *models*: by definition, they are not designed to be 100% accurate. An essential difference between their application to large and small companies is that the inherent errors in modeling may cancel out when applied to large carriers but not for small carriers. For example, a cost model may not adequately depict topographic features that

impact deployment costs (e.g., hilly or rocky terrain). With varying topographies, costs may be over-estimated in some wire centers and under-estimated in others. The average may not be seriously biased. At the other extreme, a small company may have a single study area – in this case, the modeling error may be severe. There is no opportunity to have the errors "average out" through application to multiple conditions. This imposes stringent requirements for cost model accuracy if it is to be applied to small rural carriers.

Unfortunately, the state of forward-looking cost modeling does not achieve this degree of accuracy. Notwithstanding the considerable effort and achievements of the Hybrid Cost Proxy Model (HCPM), that model remains severely limited in terms of its ability to accurately measure costs. There are two problem areas: one involves inputs and the other is structural.

The problem with inputs is the need for disaggregated input data applicable to multiple small companies. Wage rates, maintenance costs, overhead expense, etc. are impacted by geography. The Rural Task Force has documented the diversity of rural settings that pose challenges for any forward-looking cost model.[4] In addition, geo-coded location data is not as accurate in rural areas as in urban locations.[5] The need for accurate input data is hard (and expensive) to overcome, but not impossible. It is not clear that efforts to disaggregate the inputs would pass a cost-benefit test, however.

[4] See Rural Task Force White Paper 2, *The Rural Difference*, 2000.

[5] See, for example, M.R. Cayo and T.O. Talbot, "Positional error in automated geocoding of residential addresses," *International Journal of Health Geographics*, 2003, 2:10. According to this paper "error was found to increase as population decreased." In fact, in rural upstate New York, 95% of addresses were accurate to within 1.5 miles, while in urban areas 95% of addresses were accurate to within 0.2 miles.

The need for validation suggests a costly administrative process with little hope for success. A model might estimate costs for a particular company of $40/month/line while that company may have an embedded cost of $55/month/line. Absent a specific showing of inefficiencies for that carrier, the presumption must be that the model missed something important. Perhaps the soil type was different than the model could accommodate. This could be fixed by introducing a new soil type with higher cost characteristics. It is easy to envision how this modeling process becomes more complicated and burdensome. It can only be avoided by not calibrating the model results to any actual data – but "validation is not an optional exercise."[6]

The difficulties of obtaining accurate input data are confounded and overshadowed by the inherent limitation of existing cost model methodology. Current models are static and deterministic. That is, they assume that customer locations are known with certainty and that a network can be designed instantaneously, using best available current technology, to serve those locations. As noted by many, including the FCC, this lack of dynamics and inadequate treatment of uncertainty are limitations of current cost modeling methodologies.

The consequences of failure to model dynamics and uncertainty are especially pronounced in the case of universal service. In effect, a move to a forward-looking cost standard based on current technology means that incumbents will not recover the total costs of the investments they made in the past using efficient technologies at that time. Whatever the supposed wisdom of this for enhancing competition it certainly violates the need for USF to be "predictable and sufficient."

[6] Statement made by Jeffrey Rohlfs in the FCC Staff Workshop on Proxy Models, January 14 and 15, 1997.

The other implication of dynamics and uncertainty for USF is that any reduction in USF today due to technological progress means that USF has been under-funded in the past. If today's embedded cost is higher than provision using today's efficient technology, then the risk of this reduced asset value should have been reflected in USF in the past. The intuition is straightforward. Suppose you are going to lease a new personal computer to somebody over a two year time period on a fixed term contract. Suppose that a new computer will become available in one year's time that is 50% cheaper than today's model. Assume that the lessee has the option to pull out of the contract after one year. The only way in which you would be willing to undertake the investment today and sign this lease is if you recover a sufficient portion of the cost during the first year in order to price competitively in the second year.

In effect, those parties that would have the FCC shift to a forward-looking cost standard which dramatically leads to lower USF, would have the incumbents fail to receive full compensation for their investments which were efficient at the time they were made.[7] This means that past USF was not sufficient. The consequences for future rural investment are profound and disturbing.

The need for dynamic cost models is relevant to another issue raised by the Joint Board: the feasibility of developing and using a least cost model for provision of universal service that would incorporate both wireless and wireline technological options. Such a model would estimate the costs for both technologies and USF would be based on the least cost technological option. Aside from the practical difficulties of developing a model that is

[7] For purposes of this discussion, I am granting the possibility that forward-looking costs are, in fact, far lower than embedded cost due to rapid improvements in technology. I don't believe this to be an accurate portrayal of the facts, but it is the case that has been made by many parties to the USF proceedings.

accurate and can be validated (discussed above), there is a more profound conceptual problem with such an approach. Suppose we grant, for the sake of argument, that wireless technology is determined to be less costly than wireline technology for provision of universal service in a particular small community.[8] It would not be appropriate to use this to reduce the level of USF support received by an incumbent rural carrier using wireline technology unless the prior USF support had already recovered enough of the embedded cost to ensure complete recovery of costs at the now reduced level of support. That is, the embedded cost of service incorporates a depreciation cost which should reflect the degradation of value of assets that may result from the improvement of technology. If wireless technology suddenly becomes more inexpensive than wireline technology, then this fact should have been reflected in the depreciation rates of those wireline assets so that the costs of those assets are fully recovered. Failure to do so would constitute an economic taking, and perhaps a legal taking as well. Most importantly, it would undermine incentives to invest in new technology since the ultimate recovery of costs would be jeopardized. There is no free lunch: carriers will not make investments in high cost areas that enable comparable service at comparable rates if their support is only to be reduced whenever a newer and more inexpensive technological option becomes available.

Before embarking on forward-looking cost as a mechanism for reducing the costs of providing universal service, it is advisable to consider a comparable attempt at reducing the costs of another important social objective: health care for the elderly. In 1983, the federal government instituted a system of diagnostic related groups (DRGs) which attempted to

[8] I am not conceding the viability of this assumption: the relative costs of these technologies for provision of an acceptable quality of universal service would need to be demonstrated. I consider these hypothetical conditions merely to point out the more crucial question of the adequacy of funding.

standardize medical treatments and provide cost-reducing incentives to providers. Under the DRG system, providers are compensated on the basis of statistical averages of costs for a variety of conditions: if their actual costs are higher than these averages, they must absorb the difference while if their actual costs are lower, they get to keep the difference. This is analogous to a forward-looking cost mechanism that would standardize USF and divorce it from the actual costs of the rural ILECs.

There is little evidence that DRGs have been successful in reducing health care costs. There is ample evidence that it has been an administratively costly system to implement and operate. And, most importantly, any cost reductions it may have achieved may have come at the expense of the quality of the services delivered.

The use of the DRG system in Medicare has resulted in a bifurcated system where treatment for the elderly differs from that available for privately insured patients. Whatever the arguable merits of a universal service mechanism based on a similar dual standard, it is clearly inconsistent with the Act's mandate that comparable services be available at comparable rates. The Act is clear in that the provision of quality universal service is the priority of USF. Advocates would need to provide evidence that using forward-looking cost for determining USF can both reduce costs relative to the use of embedded cost while maintaining and enhancing the quality of service. Experience with the DRG system in health care provides caution concerning the wisdom of such claims.

Investment Incentives

There are two types of investment effects to consider: investment in cost-reducing effort, and investment in infrastructure. *In theory*, forward-looking costs have the advantage of providing superior incentives for cost reducing innovation and effort compared with embedded costs. *In practice*, this advantage may be offset by a number of considerations:

- Embedded costs are subject to oversight at a number of levels, including state regulators, federal regulators, NECA, the Rural Utilities Service, and owners.
- The theoretical inadequacy of cost reducing incentives of rate of return regulation is offset by the presence of time lags in rate of return proceedings. That is, the longer the time between proceedings, the stronger the incentives for cost reducing innovation.
- The fact that current USF does not support 100% of the excess of company costs over national average per line costs, means that ILECs still bear some portion of their higher than average costs. This incomplete cost recovery mitigates some of the weaker cost reduction incentives inherent in rate of return regulation and USF based on embedded cost.
- USF has been frozen for periods of time, thereby reducing the probability of cost recovery for investments and operating expenses, enhancing incentives for cost-reduction.[9]
- Competitive pressures exist in rural service areas. While these are less pronounced than in densely populated urban areas, there are still competitive threats for the wireline business of larger customers and from wireless services. Any such competitive pressure will enhance cost reducing incentives.

[9] I am not recommending caps on USF. They are incompatible with the sufficiency requirements in the Act. To the extent they have been employed, however, they mitigate concerns about potential inefficient cost-reduction incentives for rural ILECs.

- Forward-looking costs are not the only mechanism that provides improved cost reduction incentives. In theory, any mechanism that breaks the tie between support and actual costs incurred will possess superior cost reducing incentives. This means that a cost standard that results in support greater than embedded cost will provide superior cost reducing incentives, as long as the standard is unaffected by the level of each company's actual cost level.
- However, such enhanced cost reducing incentives are more illusory than real if the cost standard is not accurate. Even if the aggregate level of forward-looking costs could be accurately estimated, disaggregated costs are likely to be too high in some service areas and too low in others. This will distort investment incentives (producing excessive investment in some rural areas and deficient investment in others).
- To the extent that forward-looking cost includes speculative efficiencies not captured in embedded cost, the question is whether a lower level of universal service funding will lead to more or less investment in rural infrastructure. The answer is less.

This last point refers to the other type of investment effect to be considered – that of investment in infrastructure. The theoretical advantage of forward-looking cost is that it should represent the actual resources that would be required today to provide universal service, rather than the costs that have been incurred in the past. This potential theoretical advantage can only be realized if forward-looking costs can be accurately measured. As discussed in the last section, rural high-cost areas pose significant hurdles for accurate forward-looking cost estimation, and validation is necessary but intractable. This means that these *theoretical* advantages are unlikely to be realized in *practice*.

The Act's universal service provisions are clearly most concerned with continuing and increasing investment in rural infrastructure, and not cost-reduction *per se*. Abandoning embedded cost in favor of forward-looking cost would seriously jeopardize future rural investment for two related reasons. First, a lower level of support would make carriers less able to finance investment. Since the return on future investment is reduced, we should expect less new investment to take place.

Second, changing the rules has its own incentive effect. Regulatory commitment is a prime concern of the economics of regulation literature.[10] If regulators establish a practice of reducing support whenever a new technology becomes available (or whenever a new cost model produces lower cost estimates, regardless of their validity), future investment will be reduced. Both the return on investment and its risk are affected. Full recovery is jeopardized and capital will be more costly to obtain.

The experience with forward-looking costs as the basis for establishing unbundled network element (UNE) prices should not be overlooked. Whatever the merits of the forward-looking cost standard, the continued litigation and uncertainty is undeniable. The evidence shows that both RBOC and CLEC investment are reduced in the face of lower UNE prices, ostensibly resulting from more vigorous application of the forward-looking cost standard.[11] Rural America can ill afford to repeat this experience with universal service funding.

[10] For example, see *Privatization, Restructuring, and Regulation of Network Utilities*, by David. M. Newbery, The MIT Press, 2000.

[11] See Declaration of Dale E. Lehman, "Investment and the Level of UNE-P Rates: A Critique of the Willig Study, filed on behalf of Qwest, WC Docket No. 03-173, January 30, 2004.

Conclusion

The Act has multiple objectives and no cost concept is perfect. The Commission needs to strike a balance between promoting investment, reducing costs, and protecting the principle of comparable services at comparable rates. A forward-looking cost standard falls short of this goal. The use of embedded cost for rural ILECs is a better alternative.

My conclusion regarding continued use of embedded cost for rural ILECs is not unlike Winston Churchill's conclusion about democracy: "It has been said that democracy is the worst form of government except all the others that have been tried." Forward-looking cost is a worse alternative to embedded cost for determining USF support for rural ILECs. The Act is clear in its goal of achieving "predictable and sufficient" support for "comparable services at comparable rates." Whatever the merits of forward-looking cost as a theoretical construct, they will thwart these objectives. Support that results from forward-looking cost models, with their inherent methodological difficulties, cannot be predictable and is likely to not be sufficient for many rural ILECs.

Written Statement of Dale E. Lehman

Basis of Support for CETCs and Transferred Exchanges

Before the Federal-State Joint Board on Universal Service

Nashville, Tennessee Wednesday, November 17, 2004

Current FCC rules specify that wireless eligible telecommunications carriers (ETCs) should receive the same high cost support as incumbent local exchange carriers (ILECs) – I will call this the *equal support rule*. Proponents argue that this rule is necessary for competitive neutrality and to foster competition in rural areas, and, further, that this support be based on forward-looking economic cost. None of these arguments are correct. Competitive neutrality does not require equal support, particularly if its advocates are correct that current rural ILEC costs are bloated due to alleged "inefficiencies." Fostering competition in rural areas is not a goal of the Act, and must be viewed as secondary to ensuring comparable services at comparable rates through sufficient and predictable universal service support mechanisms. Finally, forward-looking cost is a red herring meant to distract attention from the unwarranted growth of the fund due to application of the equal support rule.

Under the goals of the Act, competition is only a means to an end. Congress enacted provisions to ensure that competition does not jeopardize universal service.

Congress was careful to treat the areas served by rural telephone companies differently from areas served by non-rural carriers, in recognition of the uncertainty regarding both the feasibility and the desirability of competition in rural service areas. The Act

recognizes that competition may not serve the public interest in rural areas through exemptions from the unbundling requirements of the Act, through requirements that designations of multiple eligible telecommunications carriers be in the "public interest," and through the ambitious universal service agenda that Congress established.

The provisions of the Act show that Congress understood that the impact of competition in rural service areas was different than in the primarily urban service territories of large carriers. It asked state commissions to carefully consider many of the pro-competitive features of the Act before applying them to rural service areas. It is precisely this careful consideration that has led the Joint Board to the present proceeding.

If competition naturally led to universal service, then the universal service provisions of the Act would be unnecessary. It is precisely because competition does not engender universal service in high-cost rural areas, or for low income households, that Congress went to great lengths to articulate universal service goals and how they were to be achieved.

Two examples of deregulation -- airlines and railroads -- illustrate how competitive market forces may lead to higher prices and less service in rural areas. These examples also show how support programs may be inadequate in addressing these deficiencies. Congress deregulated the airline industry in 1978. One of the results was the loss of service to many rural areas. Congress created the Essential Air Service (EAS) program as a subsidy mechanism to provide service where the competitive market would not. The

program provides subsidies for continued service as a result of deregulation.[1] The EAS program has not prevented significant increases in rural air service prices nor has it prevented many rural communities from losing services.

Through the Staggers Act, Congress deregulated the railroad industry in 1980 (decades too late according to many economic experts). One of the most important features of this law was the provision for railroads to discontinue freight line service on routes that were unprofitable. Prior to the Staggers Act, railroads were forced to sustain unprofitable freight routes even while attempting to compete with other transportation modes. The result was extensive losses and many bankruptcies in the railroad industry.[2] Passenger railroads, on the other hand, are unable to provide viable service to small communities, despite an extensive government subsidy program.

These examples should give pause to the idea that universal service and competition are complementary goals. Any reasonable analysis of universal service must begin with the premise that competition and economic efficiency go hand in hand, but that neither fits easily with universal service. Competition generally leads to economic efficiency (but not to universal service). However, policy-makers were not comfortable with the results of an economically efficient market for telecommunications services in high cost rural and insular areas, and for low income households. That is the purpose of the universal

[1] Details on the EAS can be found at www.ostpxweb.gov/aviation/rural/easfaqs.htm. Currently 104 communities receive EAS subsidies.

[2] A good review of the regulatory experience of railroads can be found in Gallamore, "Regulation and Innovation: Lessons from the Railroad Industry," chapter 15 in Gomez-Ibanez, Tye, and Winston, editors, *Essays in Transportation Economics and Policy: A Handbook in Honor of John R. Meyer*, The Brookings Institution, 1999, pages 499-500.

service provisions of the Act – to ensure the provision of services for rural and low income consumers that an economically efficient market might not produce. Universal service is not, in general, economically efficient, and economic efficiency is not the goal of universal service.

I am not saying that rural wireless services are undeserving of high cost support. That is a public policy question that should be posed in its own right. What I am pointing out is that the use of the high cost fund -- a fund originally developed to support landline network access in high cost areas -- to support additional wireless services in such an area, will increase the overall cost of universal service. It is more costly to support two networks than one, and it is even more costly to provide support for two disparate networks on the basis of the cost characteristics of one. That is the more optimistic scenario. The worst outcome is that political support for the USF is shaken and the high cost fund is capped, reduced, or otherwise limited. As a result, ILECs would not receive sufficient support to provide network access in high cost areas. Loss of service is <u>not</u> what is meant by universal service.

Forward-looking costs and incentive regulation are often proffered as escapes from this conclusion. These are purported to result in reduced service costs in high cost areas so that there need be no increase in the fund as a result of their policies. Like other "free lunches" these cost savings are illusions.

1. Forward-looking cost, while a valid theoretical benchmark, is not likely to further the goal of universal service in rural America (see my comments on the panel Support in Areas Served by Rural Carriers and the Definition of "Rural Telephone Company.")

It is possible to change the inputs and structure of a cost proxy model so that it reduces the size of the USF enough to "pay for" the portability of support to wireless ETCs. It is not possible, however, to make such a model capable of providing telecommunications services to rural America. No amount of model magic can produce the high quality of service that rural carriers currently provide to their subscribers. (Mis)use of a forward-looking cost model to arbitrarily reduce support levels can threaten the availability of high quality service in rural America.

2. Rate-of-Return Regulation is a red herring – its costs are overstated and its risks of its alternatives are underestimated.

Rate-of-return regulation (RORR) is the second culprit responsible for inefficiency. Presumably, if we dispense with inefficient RORR, the demands on the USF would be reduced sufficiently to pay for the equal support rule. This assessment of RORR is flawed and overly simplistic. RORR, like embedded cost, is a red herring whose only purpose is to create the illusion that portability of the USF to wireless ETCs need not cost anything.

The theoretical inefficiencies of RORR are well-known but largely irrelevant to rural ILECs and the universal service issues that need to be addressed. Price cap regulation can provide superior incentives to RORR: carriers, in theory, have incentives to reduce

costs when they can keep some (if not all) of the increased profits that may result. RORR does not have this feature so, in theory, it results in inefficiently high investment and operating costs. In theory, this comparison is unassailable. In practice, however, it is more complicated and likely to be wrong for a number of important reasons.

- Price cap regulation, in practice, is less efficient than theory would suggest.
- The empirical evidence on price cap regulation does not suggest dramatic efficiency gains.
- The application of price cap regulation to small carriers raises a number of practical problems that suggest it is likely to be less efficient than when applied to large carriers.
- RORR, as actually practiced, is not as inefficient as theory would suggest.

I now examine these points in more detail.

The theory of incentive regulation attributes efficiency benefits over RORR when the price cap regime entails no earnings reviews, no earnings sharing, and adjustments of the X factors (productivity offsets) only when industry-wide productivity patterns change. In practice, none of these factors are strictly adhered to. Earnings have either been explicitly shared, or implicitly shared through periodic adjustments to the X factors. In addition, regulators have a number of additional policy levers (entry conditions, UNE pricing, quality standards, etc.) that they may use differently under price caps than under

RORR. The theoretical advantages of price cap regulation over RORR are reduced when any of these features are present.[3]

The empirical studies of price cap regulation appear to bear this out. The evidence that price cap regulation results in cost decreases relative to RORR is weak, at best.[4] There are still questions as to whether the cost declines merely reflect decreases in the quality of service and not true efficiency gains. The result of applying price cap regulation to the large carriers has been underwhelming efficiency gains, if any.

We should expect even smaller efficiency gains (if any) if price cap regulation were to be applied to the rural ILECs. First, these are a diverse set of carriers so that design and monitoring of the price cap plans would need to vary considerably among carriers. The relevant productivity gains would be quite different for carriers that operate in significantly differing environments (geographic and demographic). Second, the move to price cap regulation requires that service quality be monitored. This means that state regulators would need to expand significantly their measurement of service quality for many small ILECs in their jurisdiction. Third, exogenous adjustments to the price cap plan would need far more attention for small ILECs than for large ones. Policy/industry

[3] See D.E.M. Sappington and D.L. Weisman, *Designing Incentive Regulation For The Telecommunications Industry*, The MIT Press, 1996.

[4] D.J. Kridel, D.E.M. Sappington, and D.L. Weisman, "The Effects of Incentive Regulation in the Telecommunications Industry: A Survey," Journal of Regulatory Economics, Vol. 9(3), May 1996, pp. 269-306, and Ai and Sappington, "The Impact of State Incentive Regulation On the U.S. Telecommunications Industry," *Journal of Regulatory Economics*, 22, 133-159, 2002. The latter found more network modernization under price caps but that "operating costs are not found to be significantly lower... on average." Sappington, "Price Regulation and Incentives," in the *Handbook of Telecommunications Economics*, edited by Cave, Majumdar, and Vogelsang, North-Holland, 2002, finds that evidence of price cap regulation on cost reductions is "mixed." Clement Krouse and Jongsur Park,

changes may have much more dramatic impacts on smaller carriers. For example, any change in service standards for rural carriers (such as RUS requirements for data speeds) may have significant cost implications that would require adjustment of the price cap mechanism. Fourth, investment spikes are more volatile for small carriers than for large ones, and this poses difficulties for the design of an appropriate price cap mechanism. One of the advantages of RORR for rural carriers is that it offers some revenue stability. This is important for a carrier with both high costs of service and costs that cannot be easily reduced under an obligation to provide service throughout its service area. In practice, far from offering a panacea, price cap regulation for the many rural ILECs promises to be a quagmire of costly administrative details.[5] Based on the current evidence, the gains appear to be small in comparison.

It must also be noted that increased efficiency of rural ILECs may not be as desirable as it is portrayed. It is likely that many rural deployments of broadband services would have been delayed (or cancelled) if a strict economic efficiency criterion were applied, due to relatively low consumer adoption rates and/or small market sizes.[6] The most recent NTCA survey showed that while 92% of respondents are making broadband services available their customers, only 21% of their customers subscribe to 56 kbps service, 8% to 200 kbps – 500 kbps service, and 2% each subscribe to 1 Mbps and 3 Mbps services[7] Price cap regulation would provide incentives *not* to deploy unprofitable services. RORR

"Price Effects of Incentive Regulation in Local Exchanges," *Information Economics and Policy*, June 2003 find more evidence of price decreases than cost decreases under price cap regulation relative to RORR.

[5] This may explain, in part, why adoption of price cap regulation in the electric industry has not been as pervasive as in telecommunications.

[6] For example, see D.E. Lehman, *The Costs of Competition*, NTCA White Paper #3.

[7] *NTCA 2004 Internet/Broadband Availability Survey Report.* Available online at www.ntca.org.

limits these incentives but does not eliminate them, since the deployment costs are part of the revenue requirement of the regulated firm. Unprofitable services are also likely to be economically inefficient services.[8] So, if regulators wish economic efficiency as a goal, then price cap regulation will help promote this by *decreasing* the provision of broadband services in rural areas. If this outcome is not what regulators want, then they should be wary of the purported benefits of moving from RORR to price cap regulation.

Similarly, RORR is not as inefficient in practice as in theory. RORR carriers have multiple incentives to operate efficiently. Significant competitive pressure exists in the form of wireless usage, IXC bypass, VoIP, etc. Wasteful practices and unnecessary investments are not wise strategies for rural ILECs. They have multiple auditors, both internal (shareholders, coop members, etc.) and external (regulators, private and government lenders, NECA, USAC).[9] It is an insult to this oversight effort to simply dismiss the accounting data as not being audited.

It is asserted that RORR provides incentives "to pad costs" but often overlooked are the incentives of CETCs (and others) in a forward-looking cost study. Forward-looking cost studies have an unprecedented ability to produce unachievable low cost estimates (e.g., for services a CETC might be purchasing from ILECs) or unrealistically high costs (e.g., for support funds that a CETC might receive). Indeed, one can always claim their cost

[8] Lack of subscription is an indication that the service's value does not exceed its cost. If there are significant network externalities for broadband services, then their provision may be efficient even if it is unprofitable for the service provider.

[9] Indeed, Attachment C to the Western Wireless submission is evidence that embedded costs *can* be audited, unlike forward-looking economic costs.

study is more forward-looking than another if it provides cost estimates that are lower than the other!

Many small ILECs are average schedule companies – this is a form of incentive regulation where their earnings depend on the actual costs of similarly situated cost companies, and are divorced from their own particular cost experience. This means that companies can retain the benefits of cost-reducing innovations that lower their costs relative to those of similar carriers. These costs are a sort of proxy for each company's costs – but one based on actual operating experience rather than a hypothetical and unauditable measure of nobody's costs.

There are two additional reasons to believe that RORR is not all that inefficient. First, there are often long lags in the adjustment of retail rates. If retail rates rarely adjust, firms can retain any cost reductions for extended periods of time – similar to a price cap regime. Second, to the extent that there is competitive pressure from wireless services, they also provide incentives for firms to minimize costs.

The final irony in the "free lunch" offered by using forward-looking costs and price cap regulation is that it undermines the logic for the equal support rule to begin with. If rural ILECs are inefficient and have unnecessarily high costs of service, then there is no reason why CETCs need equal support in order to compete.

Competitive Neutrality is not a useful concept for awarding wireless carriers the same support as ILECs. Wireless and wireline services are situated differently in important ways, and leveling the playing field requires a multidimensional policy approach.

It is wrong to think of wireless and wireline services as the same. There are important dimensions in which they differ, including:

- They have different cost structures. Landline technologies have large economies of scale compared with wireless technologies.[10]
- They have different quality attributes.[11] The main advantage of wireless services is mobility, a trait that cannot be matched by landline services. On the other hand, wireline quality of service and availability are regulated by state regulatory commissions but mobile services are generally not.
- They have different service areas – in fact, the meaning of service area is different for the two. Billing address generally is the same as service address for wireline providers. Billing address has little meaning to a wireless provider in terms of where they need to provide service.
- They have different service qualities. Landline services generally receive high customer service ratings. Wireless services often receive poor ones.[12]

[10] Evidence of this appears in the *CMRS Competition Report, Eighth Report*, July 14, 2003 issued by the FCC. Paragraphs 112-113 reveal that there are 3.2-3.3 mobile competitors on average in rural areas, with 2.7 on average in the most rural category (<25 people/mi^2). Paragraph 118 notes that rural and urban mobile prices are similar (despite the lack of USF). Clearly, the cost structure for mobile carriers in rural areas differs from that of wireline carriers. The appendix discusses evidence on wireless cost structures in more detail.

[11] See OPASTCO Reply Comments, June 3, 2003, CC Docket No. 96-45, FCC 03J-1, section III. D., pages 13-15.

[12] Complaints related to wireless service quality increased significantly during the 1st quarter of 2003, compared to the prior quarter. See, *Quarterly Report on Informal Consumer Inquiries and Complaints for the First Quarter of 2003*, FCC Consumer and Governmental Affairs Bureau (rel. May 30, 2003).

- They have different pricing structures. Landline services generally include unlimited calling within the local area, while wireless services have a variety of usage-based pricing schemes.
- They have different revenue patterns. Rural ILECs may get as much as 40% of their revenue from access charges while CMRS providers receive virtually no switched access revenues from long-distance providers, but have significant roaming revenues instead Western Wireless receives 25% of its revenues from roaming agreements, a source not available to ILECs. In fact, CMRS providers receive reciprocal compensation payments for terminating traffic. They *choose* to negotiate carrier-specific long-haul transit rates and they can *choose* whether or not to charge access fees. In short, they have the freedom to adopt the same rate structure as ILECs if they want – what is different is that regulators do not constrain their pricing.
- They have different public policy constraints. Wireless carriers do not have carrier-of-last-resort obligations. This includes the requirement to build and maintain network facilities to serve all customers within the service area – facilities that may be relied upon by CETCs to provide coverage in those same areas. Wireless carriers do not have to provide equal access to long-distance carriers. Wireless carriers also have a different timetable for deploying local number portability. Wireless carriers are generally unregulated in their pricing, while landline carriers have heavily regulated pricing structures.